



TITLE:

Studies on the Optimum Temperature of Catalase-activity

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CITATION:

Kondo, Kinsuke ...[et al]. Studies on the Optimum Temperature of Catalase-activity. 京都大学化学研究所報告 1952, 27: 73-74

ISSUE DATE:

1952-02-25

URL:

<http://hdl.handle.net/2433/74346>

RIGHT:

by the indicator method ($C_{12}\sim C_{18}$) (Asahara et al.; Ind. Chem. Japan, **54**, 70 (1950) and the displacement method ($C_1\sim C_{22}$) (R.H. Holman and L. Hagdahl; J. Biol. Chem. **182**, 421 (1950)). We tried to separate chromatographically each component from mixtures of higher (stearic and oleic acids) by a new indicator method, using iodine as an indicator and alumina as an adsorbent. The results obtained were as follows. 1 mg of iodine was dissolved in 10cc. of petroleum-ether and adsorbed to alumina activated at 500°C. Below 500°C., alumina was never coloured with iodine. When 25cc. of petroleumether solution of stearic and oleic acids were added to the top of the column at the rate of 5 min. per cc., a yellow line appeared at about 5cm. from the upper end of the column and below this line no solute was adsorbed, but the separation was incomplete. Under similar conditions separation was enhanced by using 120cc. of the mixture of petroleumether and benzene as developer and reducing the rate of flow to 15min. per cc., but the upper layer contained 33% of unseparable oleic acid.

Furthermore, if the petroleumether-benzene-ethanol was added with the rate of 35 min. per cc., two yellow lines were formed and the first layer coloured white, the second light yellow, the third light white brown and the fourth light brown. From their melting points and iodine values, the first layer was considered to contain pure stearic acid, the second a mixture of two acids, and the third pure oleic acid.

30. Studies on the Optimum Temperature of Catalase-activity

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We have already found the distinct difference between the optimum temperature of catalase-activity of the summer- and winter-crops and -vegetables.

On this discovery, it was concluded that the phyto-catalase was variable according to the kind of plants and the planting season.

The present paper deals with the experimental results on the zoo-catalase. The optimum temperature of the catalase-activity of various animals was found as follows.

Cow, rabbit and cat :	about 40°C
Cook :	about 50°C
Toad (October) :	about 10°C
Snake (September) :	about 25°C
Tunny and oyster :	about 20°C

Eel :

about 30°C

The thermo-stability of these enzymes was examined with the results that the catalase with low optimum temperature was less stable on heating than that with high optimum temperature.

31. Studies on the Utilization of Pentose by Microbiological Method. Pentose-Assimilable Yeasts. (II)

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In order to verify the availability to the waste liquors from factories, for instance pressed juice of sweet potato (I) and sulphite pulp waste liquor (II), for manufacturing fodder yeasts, series of experiments were carried out with three strains of pentose-assimilable yeast (*Torulopsis xylinus* a, b, c) isolated by us.

(I) was adjusted to pH 4.5 by HCl, kept for 1 hour at 70°C and filtered. The filtrate was found to contain 5.50 g of sugars and 0.15 g of nitrogen in 100 c.c. Experiments were carried out with the dilute solution of (I) containing 2.50 g of sugars in 100 c.c. In some cases inorganic salts or malt extract were added to the diluted solution. In the case of shaking culture, the amount of remaining sugar and the yield of yeast were observed at 3, 6, 9, 12, and 24 hours' incubations. It is pointed out that, in every case, the consumption of sugar was attained to above 85%, and the percentage of the crop yield of yeast to the sugar consumed was found to be about 45%. Therefore any remarkable effect on the addition of inorganic salts or malt extract was never detected. The chemical compositions of the yeast thus obtained (7.38% ash, 49.10% crude protein, 3.50% crude fat and vitamin B₁ 15.7γ) were found to be similar to those of the yeast obtained from ordinary medium.

(II) was refined as follows: the free SO₂ (1.98 g/L) was expelled by aeration and then by neutralization with Ca(OH)₂. The filtrate was found to contained 13.06 g of organic matters, 3.23 g of sugar (as glucose), 0.012 g of nitrogen and 0.99 g of free SO₂ in 100 c.c. Experiments were carried out with dilute solutions of the filtrate, in the same manner as was mentioned above. It is pointed out that the addition of nitrogen substances was necessary for the fermentation of (II), and such substances as (NH₄)₂SO₄, pressed juice of sweet potato and rice bran eytract were found to serve available sources of nitrogen. The yield of yeast, especially *Torulopsis xylinus* c, attained to a maximum on 24 hours' incubation, when sugar was consumed to 51.14% and the percentage of the crop yield of yeast to the sugar consumed was found to be 37.54%. These yeasts were concluded to be useful for fodder yeasts, from their chemical constituents.